Dual

OWNER'S MANUAL

DUAL 1019

AUTO/PROFESSIONAL TURNTABLE

INTRODUCTION

You may find this a most unusual instruction manual . . . because it is about a most unusual record playing instrument. There are so many design and operating features to the Dual 1019 that we have taken this opportunity to show and describe all of them to you . . . just in case you may have overlooked some of them.

Now, if you are impatient to get set up, just open this flap where you will see a photograph of the 1019 with each feature illustrated and described. Then turn to page 8 where the procedures for installation begin.

But if you can wait a few minutes, we suggest you familiarize yourself with the 1019's many operating features, beginning on page 2, paying particular attention to the highly advanced anti-skating compensation and Cue-Control. As you will see, there is far more to the Dual 1019 than could ever meet the eye.

When you are in the mood to show off to your friends, this manual may also come in handy.

Good luck and good listening.

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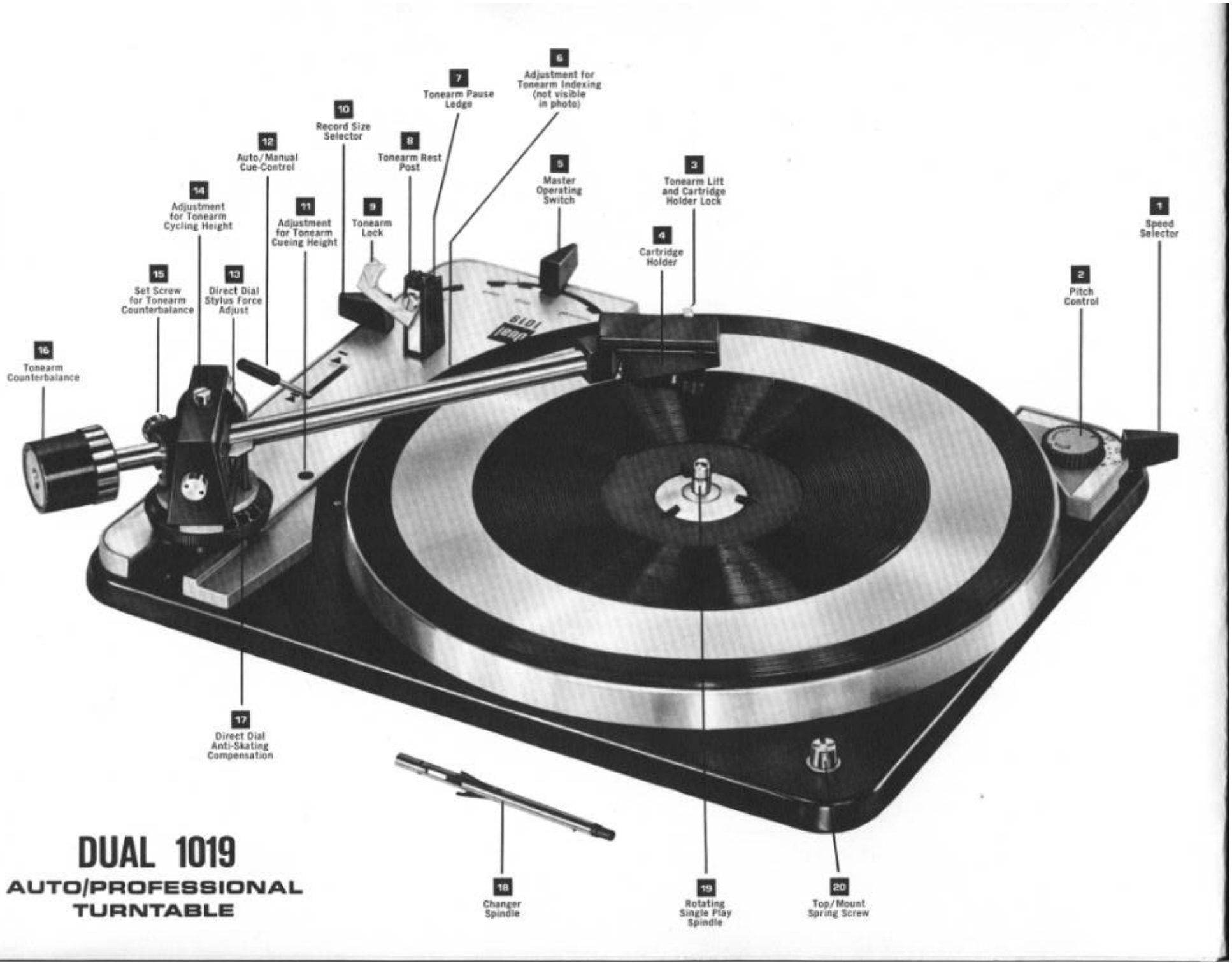
1 Speed Selector
2 Pitch Control
3 Tonearm Lift and Cartridge Holder Lock
4 Cartridge Holder
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20 Top/Mount Spring Screw

DUAL 1019

AUTO/PROFESSIONAL TURNTABLE

DESIGN AND OPERATING FEATURES

1 SPEED SELECTOR

For all four standard speeds: 16, 33, 45, 78 rpm.

2 PITCH-CONTROL

Allows each speed to be varied over a 6% range. Assures perfect pitch with all records.

3 TONEARM LIFT/CARTRIDGE HOLDER LOCK

Quarter-turn to rear releases cartridge holder for fast cartridge interchange.

4 CARTRIDGE HOLDER

5 MASTER OPERATING SWITCH

Controls all operating functions: Automatic start and stop, manual start, reject. Use with both single play and changer spindles.

6 ADJUSTMENT FOR TONEARM INDEXING

7 TONEARM PAUSE LEDGE

For convenience and speed when turning records over in single play. Platter continues to rotate. Especially useful when power to amplifier is controlled by turntable. (See power control page 9.)

8 TONEARM REST POST

Entire unit shuts off when tonearm is returned to post, either automatically or manually.

9 TONEARM LOCK

Secures tonearm to rest post. (No need to worry if unit is started when tonearm is locked. Tonearm is engaged to cycling mechanism by foolproof slip-clutch, no mechanical linkage.)

10 RECORD SIZE SELECTOR

For 7", 10" and 12" records.

11 ADJUSTMENT FOR TONEARM CUEING HEIGHT

Allows for different cartridge heights by varying stylus-to-record distance for cueing. Adjustment range: 3/8".

12 AUTO/MANUAL CUE-CONTROL

Lowers and raises tonearm at any position on record. Can be used together with either automatic or manual start and at any time during play, with either single play or changer spindle.

13 DIRECT-DIAL STYLUS FORCE ADJUST

Dials continuously variable stylus force from 0 grams up.

14 ADJUSTMENT FOR TONEARM CYCLING HEIGHT

15 SET-SCREW FOR TONEARM COUNTERBALANCE

Locks counterbalance on shaft after rapid balancing of tonearm.

16 TONEARM COUNTERBALANCE

Rotates on fine threads for precision tonearm balance. Nylon-braked to prevent slippage. Rubber damped for low tonearm resonance.

17 DIRECT-DIAL ANTI-SKATING COMPENSATION

Continuously variable anti-skating compensation. Numerals correspond precisely to tracking force scale.

18 ELEVATOR-ACTION CHANGER SPINDLE

Holds up to ten records of same size and speed. Retracting platform permits removal of records from platter without need to remove spindle.

19 ROTATING SINGLE PLAY SPINDLE

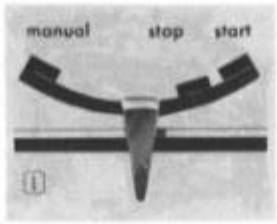
Pressure-fits into platter shaft, rotates with record during play.

20 TOP/MOUNT SPRING SCREW

Allows mounting and securing of Dual to base or mounting board from above.

OPERATING INSTRUCTIONS

Master Operating Switch



This *one* feather-touch slide switch controls all operating functions, in both single play and changer operation, as described below. For automatic start, you move it past STOP to START. For automatic stop or reject, move it to STOP. To start the platter rotating without putting the tonearm into cycle, move to MANUAL after lifting tonearm from resting post.

Preparations for Play

Select the correct speed and record indexing size for the record to be played, then insert either the short spindle (for single play) or the Elevator-Action spindle (for changer operation).

Single Play

1. **Automatic Start:** move the slide switch to START.

2. **Automatic Start with Cue-Control.** First move Cue-Control to position ▼, then move slide switch to START. (This provides an even more gradual tonearm descent, as sometimes preferred for ultra high compliance cartridges.)

3. **Manual Start (on rotating record):**

a. Lift tonearm and move switch to MANUAL. (This can easily be done as shown in fig. 3.)
b. Place tonearm on record.

4. **Manual Start (on motionless record):**
a. Place tonarm on record.
b. Move switch to MANUAL.

5. **Cue-Control Start (on rotating record):**
a. Move Cue-Control to position ▼.
b. Place tonearm over lead-in groove (or over any other groove).
c. Move switch to MANUAL.
d. Flick Cue-Control to position ▼.

6. **Cue-Control Start (on motionless record):**
Same as 5, but reverse steps d and c.

7. **To stop play:** (tonearm returns to rest, motor shuts off)
Push to STOP.

8. **To interrupt play and replay from beginning:**
Push to START.

9. **To interrupt play:** (when play is to be resumed in same groove)
Move Cue-Control to position ▼.

10. **To resume play in same groove:**
Flick Cue-Control to position ▼.

NOTE: at the end of play, the tonearm will return to its resting post and the entire machine will shut off automatically.

Automatic Changer Operation

Insert the changer spindle by placing the key at its base into the slot of the shaft. Then turn the spindle clockwise *until it stops*. Up to ten records can be placed on the spindle.

All the functions for single play, as described above, are exactly the same in changer operation, plus these additional functions:

1. **To reject a record during play and change to the next record on the spindle:**
Push to START.

2. **To skip the next record on the spindle:**
Push to STOP. After that record drops, push to START and the next record will drop.

NOTE: Any record already on the platter can be replayed either automatically or manually, with or without Cue-Control, just as with the single play spindle. If there are any records on top of the one you wish to replay, simply lift them back onto the platform or off the spindle. (The 3-pronged platform will retract into the spindle as the records slip past.) No need to remove the spindle itself.

Jamproof Tonearm

During either single play or changer operation, the tonearm can be lifted from the record, moved and placed down again either by hand or by the Cue-Control. The tonearm may even be restrained during cycling without causing any malfunction . . . thanks to its foolproof slip-clutch.

DYNAMICALLY BALANCED TONEARM WITH DIRECT-DIAL STYLUS FORCE ADJUST

Flawless Tracking as Low as ½ Gram

Not all so-called "dynamically balanced" tonearms actually measure up to that important qualification, as dynamic balance requires that the tonearm's integral mass remain balanced at all times when tracking.

The Dual 1019 maintains its true dynamic balance in all planes because tracking force is applied at the pivot point by a long, multiple-coiled mainspring (Fig. 5A). The weight of the tonearm itself remains in constant balance.

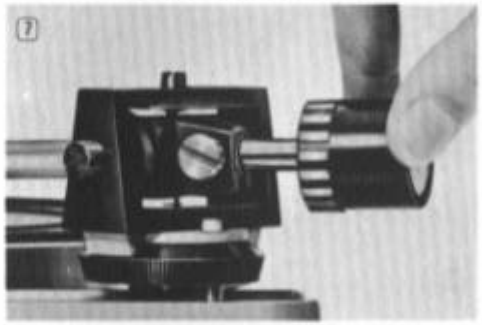
Friction-Free Pivots

The pivot of the Dual 1019's tonearm is virtually friction-free (less than 0.1 gram) in both the vertical and horizontal planes. For its vertical movement, the tonearm is pivoted on two hardened steel points, each supported by precision ball bearings. (Fig. 5B) In the horizontal movement, double ball bearing units are used. (Fig. 5C)

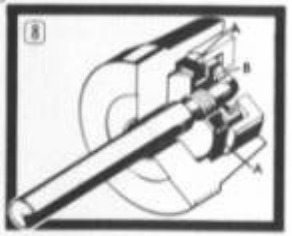
Direct-Dial Stylus Force

Tracking force is applied with the same order of precision as used in balancing the tonearm. The continuously variable adjustment (from 0 grams up) is also essential with ultra-lightweight tracking. The readings on the dial (Fig. 6) are accurate to within 0.1 gram.

Elastically Damped Counterbalance with Rapid and Fine Adjust



The counterbalance is slipped onto the rear of the tonearm and positioned on its shaft for rapid approximate balancing for the weight of the cartridge, then locked with the set screw. For absolute precision in balancing, essential in ultra-lightweight tracking, the counterbalance is then turned on its fine threads. (Fig. 7)



Dual's precision craftsmanship can be appreciated in the cutaway illustration of the counterbalance. Elastic damping (Fig. 8A) eliminates any shock or vibration from the counterbalance being transmitted to the tonearm itself. Nylon braking (Fig. 8B) applies pressure on the shaft, allowing for continuously variable fine-thread adjustment without slippage.

Featherlight Tripping

The tripping action is accomplished by a lightweight glider which rides freely on a ball bearing toward the center as the tonearm approaches the run-out grooves. When the stylus reaches these grooves, the glider is brought into featherlight contact with the free-suspension trip switch, and the automatic trip immediately takes over. Less than 0.4 gram force is sufficient to activate the switch.

"At-Home" Demonstration of Tonearm Balance, Tracking and Low Bearing Friction

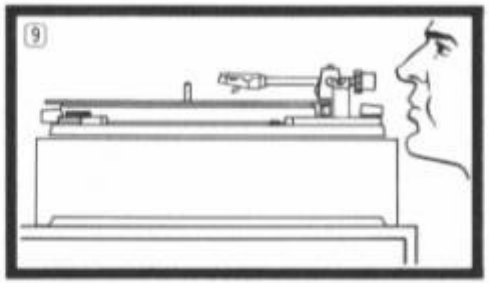
Among the final "torture" tests that each Dual 1019 must pass at the factory are some which you can easily duplicate at home. We believe that you will find them both interesting and impressive demonstrations of the precision tracking possible with this truly remarkable instrument.

Tripping at ½ Gram

If you have a high compliance cartridge and a new record with smooth run-out grooves you can witness the phenomenon of a tonearm actually tripping at ½ gram! Just set the stylus force scale accordingly, and place the tonearm on the record near the center, just outside the run-out groove. Then press the slide switch to MANUAL and watch the effortless tripping performance.

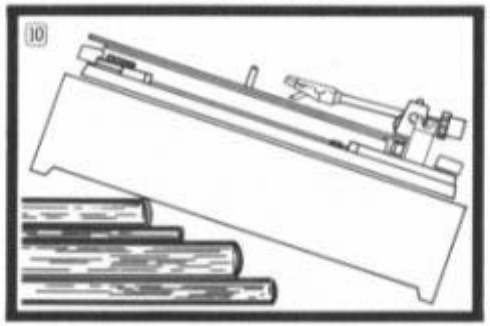
Tripping at "Zero"

Try this also. With the stylus force scale set at 0, allow the tonearm to float over the record in mid-air. Push to MANUAL to rotate the record, then blow gently on the tonearm from the side . . . just enough



to ease it toward the center. (Fig. 9). As your breath alone moves the tonearm, it will again trip and then float gently back. (Because it is set at 0 tracking force, the tonearm will not descend to its resting post. So be sure to restore the normal tracking force for your cartridge.)

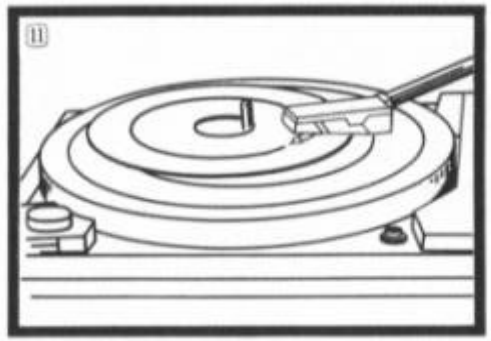
Tonearm Balance



With a 12" 33-rpm record on the platter and the stylus force set at 1 gram, prop the Dual up as shown in Fig. 10* at any angle up to 60°. When you push to START, the tonearm will index and track flawlessly, as a demonstration of its perfect balance in all planes. (While tracking, the Dual can be tilted even further to almost 90°.)

Vertical and Horizontal Movement

Now, without tilting the Dual itself, place a cigarette or short pencil between the record and platter to simulate the effect of a badly warped record. Again, the tonearm will track flawlessly, this time as a demonstration of the low friction in the vertical pivot.



Finally, for the "piece de resistance," test for low friction in the horizontal pivot. To do this, place a large-hole 7" record on the platter, but off center. (Fig. 11) Place the tonearm on the lead-in groove and push to MANUAL. The sight of the tonearm swaying back and forth while tracking is indeed startling.

*You can actually tilt the Dual from any side except the right, as the free action of the trip switch would then cause it to be activated at about 20° tilt. Needless to say, the Dual requires no leveling.

CONTINUOUSLY VARIABLE, DIRECT-DIAL ANTI-SKATING COMPENSATION

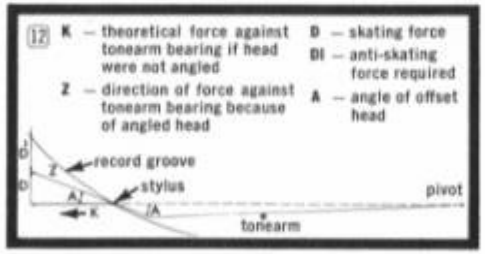
What You Should Know About Skating

Skating refers to the side-thrust imparted to the stylus from the offset angle of the tonearm head and the friction between the stylus and the rotating record.

This causes the stylus to "skate" toward the center of the record, thus causing increased force against the inner groove and correspondingly less force against the outer groove. This results in distortion, increased wear on the inner groove and uneven wear on the stylus itself.

Skating is actually not a serious problem with ordinary tonearms, as their bearing friction in the pivot is generally high enough to cancel out or minimize the tendency to skate. Of course, bearing friction high enough to prevent skating is also high enough to compromise tracking performance at the ultra-lightweight forces now made possible by today's finest high compliance cartridges.

Skating Force Actually Measurable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K – theoretical force against tonearm bearing if head were not angled
Z – direction of force against tonearm bearing because of angled head
D – skating force
DI – anti-skating force required
A – angle of offset head
record groove
stylus
pivot
tonearm

The amount of skating force is directly measurable, and amounts to about 12% of tracking force. Fig. 12 illustrates the physical principle behind skating and the forces that cause it.

A tonearm with 2 gram tracking force will thus have a potential skating force of .24 grams. We say *potential*, since, as noted above, if a tonearm's bearing friction is above .24 gram, it won't skate.

The bearing friction of the Dual 1019 tonearm, on the other hand, is *lower than 0.04 gram* in the horizontal plane. Thus, anti-skating compensation of the same high order of precision – and with continuously variable control – was one of the major goals and achievements of the 1019's design.

Applying Anti-Skating Force with the 1019

Just as you set stylus force on the Dual with a continuously variable direct-reading dial, so do you set the anti-skating compensation for that same force. (Fig. 13).

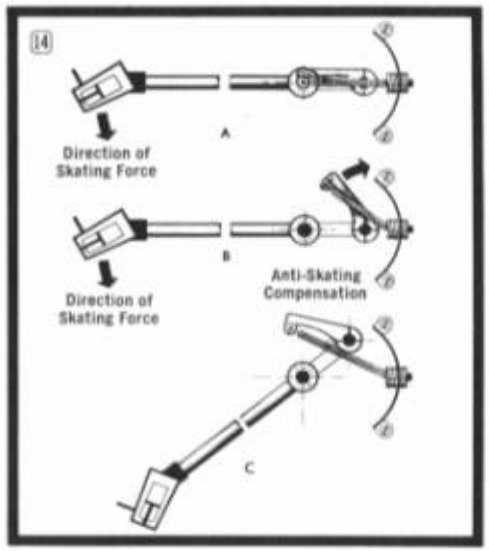
Tracking Force	Anti-Skating Compensation for Stylus Radii (in mils)						
	0.4	0.5	**0.6**	0.7	0.8	0.9	0.2 x 0.9 elliptical
0.5	0.70	0.60	**0.50**	0.50	0.45	0.40	0.85
1.0	1.25	1.15	**1.00**	0.95	0.90	0.85	1.50
1.5	1.80	1.60	**1.50**	1.45	1.40	1.35	2.10
2.0	2.30	2.10	**2.00**	1.95	1.90	1.85	2.70
2.5	2.90	2.60	**2.50**	2.45	2.40	2.35	3.40
3.0	3.50	3.10	**3.00**	2.90	2.85	2.80	4.20
3.5	4.10	3.65	**3.50**	3.40	3.35	3.30	
4.0	4.75	4.25	**4.00**	3.90	3.85	3.80	
4.5		4.60	**4.50**	4.35	4.30	4.20	
5.0		5.30	**5.00**	4.85	4.75	4.60	

As shown by the bold-face numerals in the chart, the anti-skating compensation is calibrated for the most commonly used round stylus radius (0.6 mil). This calibration is also sufficiently accurate for other stylus radii as well.

What's more, for the perfectionist who wishes to take the fullest possible advantage of the precision anti-skating compensation now made possible, the other columns indicate the adjustment to be made for other radii from 0.4 mil to 0.8 mil, as well as the elliptical stylus (0.2 mil x 0.9 mil).

This means that for the first time you can *actually balance stylus force for both stereo grooves!*

All this is one more example of how Dual assures you of the best possible performance from any cartridge/stylus combination.



These illustrations show how anti-skating compensation is applied within the tonearm system of the Dual 1019. (A) No anti-skating force applied. (B) Anti-skating force applied by special non-fatiguing spring. Tonearm in rest position. (C) Tonearm now in extreme center position. Though spring is extended, anti-skating force is not increased, due to angle which correspondingly reduces pull of the spring.

AUTO/MANUAL CUE-CONTROL™

Precise Stylus-to-Groove Cueing

With the Auto/Manual Cue-Control, still another measure of flexibility and precision has been added to the unrestricted automatic and manual play that has long been available in all Dual automatic turntables.

The Cue-Control makes it possible to pre-position the stylus over any groove and then lower it with absolute accuracy into that very same groove. You can also play to any point, interrupt with the Cue-Control, and resume play at that very note. (This serves as an effective test for eccentric record center holes.)

A close look at the stylus as it descends will show how the vertical piston action of the Cue-Control mechanism raises and lowers the tonearm with no side-shift whatever, regardless of portion of the record being played.

You will also notice how the silicon damping slows the descent of the tonearm . . . a far more gentle descent than would ever be possible by hand.

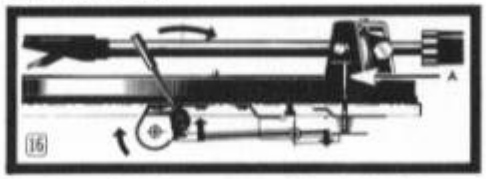
Using the Cue-Control

The Cue-Control has two positions: ▼ to lift the tonearm, and ▼ for lowering it. (Fig. 16) To lower the tonearm to any groove, you need give only the lightest flick to the Cue-Control. The descent of the tonearm is immediately taken over by silicon damping and a piston action. Lowering speed is 0.5 cm/second, and is unaffected by temperature or humidity changes.

To raise the tonearm, on the other hand, you *do* control the rate of ascent by the speed with which you move the Cue-Control from position ▼ to position ▼.

With Automatic Start Too!

The Cue-Control can also be used together with automatic start for a slower-than-normal rate of descent, as may be desired with ultra-high compliance styli. Once the cycling action has placed the tonearm over the lead-in groove and it begins to descend, then Cue-Control takes over. The Cue-Control itself is automatically shifted to position ▼, where it is ready to raise the tonearm at any time during play.



Cue-Control is shown at position ▼, with tonearm supported by piston (A). When Cue-Control is shifted to position ▼, the piston is released and permits tonearm to slowly lower to record. At this point, the tonearm is completely disengaged from the Cue-Control.

Variable Cueing Height

The height of the stylus above the record from which the Cue-Control lowers the tonearm has been pre-set for the average cartridge depth. This height can be varied over a 3/8" (10mm) range by means of the adjustment screw (10) located on the chassis in front of the anti-skating compensation dial. Turning this screw counter clockwise reduces the height, turning it clockwise increases the height.

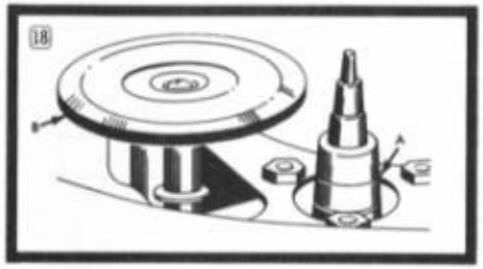
PITCH-CONTROL(™)

Each of the four standard speeds (16, 33, 45, 78 rpm) can be varied over a 6% range with the vernier Pitch-Control(™). This unique feature is especially valuable to serious music listeners, students, those recording onto tape, and every perfectionist.

Wherever you set the Pitch-Control, speed will remain absolutely constant. (You can check it yourself with the strobe disc supplied.)

How the Pitch-Control Works

This has been achieved by a simple and foolproof method that *does not change or affect motor speed or power in any way*. The motor drive pulley (A) has four precisely tapered sections, one for each speed, as shown in Fig. 18. The idler wheel (B)

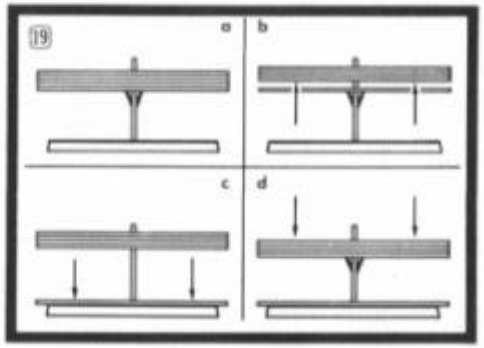


is positioned at one of these sections by the speed selector switch, 1. Then the idler wheel is raised and lowered along the section by the Pitch-Control 2. The motor drive pulley and the idler wheel disengage automatically after play, thus preventing any possibility of flat spots developing on the idler.

ELEVATOR ACTION(™) CHANGER SPINDLE

The Elevator-Action changer spindle, which holds up to ten records offers another exclusive Dual feature that protects your records against any possible damage such as may occur from the use of pusher arm mechanisms or offset spindles.

Fig. 19 illustrates the four steps of the Elevator-Action. First, the entire stack rests upon a three-pronged platform (a). When the slide switch is pushed to START, the weight of the entire stack is lifted off the bottom record (b), which is then released to descend to the turntable (c). The stack now lowers (d) to await the next change cycle.



This method is foolproof with all records that conform to the international standards of the record industry as to the size and concentricity of the center hold. (On rare occasions when a record does not drop properly, it is most likely due to excess label paper extending into the record hole, which should be clean.)

SEVEN POUND-PLUS DYNAMICALLY BALANCED TURNTABLE PLATTER

If you weren't prepared for over seven pounds of turntable platter, you were probably surprised as you lifted it for the first time. Little wonder, as no other automatic equipment has a motor required to reach full speed virtually instantaneously with such mass and thus provide the resulting superior flywheel action that contributes importantly to constancy of speed.

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The perfect balance of the turntable platter was painstakingly arrived at by the precisely calculated addition of molten metal into the specially drilled wells around the bottom rim, (Fig. 20). Twelve wells are provided for this purpose, although only two or three are usually used.

The metal used in the turntable is a non-ferrous alloy, and thus offers no possibility of magnetic interaction with the cartridge.

Concave Mat Surface

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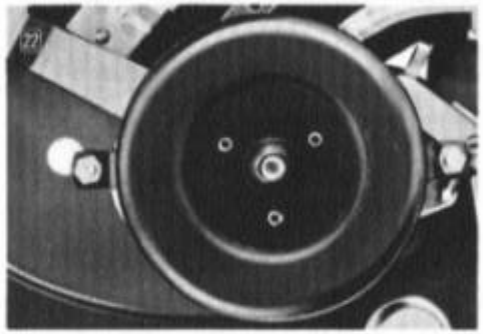
Here's another fine point that's easy to overlook. as shown in Fig. 21, the center of the ribbed mat is lower than the outer rim. This is to provide the record with support around its widest circumference, especially important in preventing warped records from slipping.

The mat itself is anti-static, and reduces the amount of static electricity in the record.

POWERFUL, CONSTANT SPEED CONTINUOUS-POLE(™) MOTOR



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Of entirely new design, the Dual's powerful and utterly quiet Continuous-Pole™ high torque motor effortlessly brings the heavy turntable to full speed virtually instantaneously. The rotor is dynamically balanced in both planes. Together with the evenly and precisely distributed poles, this eliminates at the source, one of the major sources of rumble and assures speed constancy.

All four speeds are accurate within 0.1%, with one to ten records. Further, voltage variations can exceed ± 10% with no effect on speed whatever! Thus the Continuous-Pole motor combines the advantages of the induction and synchronous motors.

ACOUSTIC FEEDBACK ELIMINATED

The only vibrations induced upon the stylus should be those originating from the recorded grooves. Any others, such as those present in the speakers, must be isolated from the stylus, or it will repeatedly transmit those spurious signals throughout the system — as "acoustic feedback."

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Dual has taken extraordinary care in eliminating anything that would tend to induce acoustic feedback. For example, the spring-mounted footings (Fig. 23) are internally cushioned with rubber between spring and caps. Further, the springs themselves are "soft," because the feathertouch side-to-side action of the operating slide switches do not require stiff vertical resistance.

The tonearm counterbalance is also rubber-isolated from its shaft, as you will notice when handling it. (See page 2.) And the motor, of course, is thoroughly insulated against both shock and vibration. These are some of the "inside" reasons why you will find Dual automatic turntables in the highest quality single-cabinet consoles that can reproduce the full frequency response range without concern for acoustic feedback.

INSTALLATION INSTRUCTIONS *(We suggest you open the front cover flap to expose the photograph of the Dual 1019)*

Installation on Base or Mounting Board*

Required dimensions: 12¾" width; 11½" depth (including 1" for rear overhang of tonearm). 6½" height above base, 3" below.

These ingeniously designed mounting screws make it possible to install and remove your Dual from either base or mounting board entirely from the top. There's no need to fumble underneath or to take anything apart.

1. Position the chassis over the base so that the three cupped spring-mounted footings will fit into their cut-outs. (The notch on the base for the rear top/mount spring screw will then be at the upper left.) Tilt both mounting screws to let them slip past the notches as you lower the chassis. (Fig 24A)

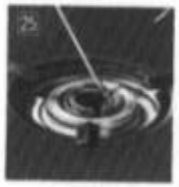
2. Turn each screw clockwise until it is firmly seated into the top of the chassis. (Fig. 24B) That's all there is to it. To remove the Dual, simply reverse the above procedure.

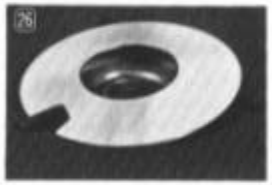
To Transport the Dual Without Demounting

1. Loosen both top/mount spring screws, depress the chassis against the base, then continue to turn each screw counter-clockwise until it stops. The chassis will then be locked firmly against the base. (Fig. 24C)

2. To avoid possible damage to the platter bearings in transit, insert the plastic wedges (supplied in the accessory bag) between the platter and chassis. Position the wedges at equal distances for maximum support. Or you can remove the platter from the chassis (See below).

Mounting the Platter*





With the chassis now on its base, slowly and gently lower the platter onto the shaft.

The oiled felt plug in the center hole will lubricate the shaft as it is forced out, and it may then be discarded.

Now secure the platter by snapping the spring-clip around the groove of the shaft. (A small screw driver will be handy, as shown in Fig. 25.) Position the spring clip so that its ends do not block the slit.

Finally, insert the decorative round disc under each of the three lips on the mat. (Fig. 26)

Mounting the Cartridge*

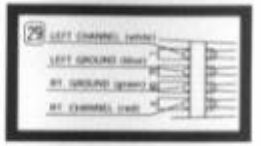
NOTE: Any cartridge weighing between 0.5 and 12.5 grams and meeting standard U.S. mounting specifications can be used with the Dual 1019.

1. Release the cartridge holder from the tonearm head by pressing the tonearm lift a short turn to the rear. Be ready to catch cartridge holder, as it will drop right into your hand. (See Fig. 30 below.)

2. Mount the cartridge to the holder, using either the hardware supplied with the cartridge or the hardware supplied with your Dual. (Note in Fig. 27, head of screw is against the holder and the nut is against the cartridge.) The length of screw to use depends on the dimensions of your cartridge. Don't tighten the screw firmly yet.

3. Using the special gauge supplied, slide the cartridge back or forward until the stylus tip is centered within the notch as shown in Fig. 28. Now tighten the screw.

4. Connect each lead on the cartridge holder to its corresponding pin on the cartridge. Each lead is color-coded as shown in Fig. 29.



5. Attach the cartridge holder by placing it against the tonearm head as shown in Fig. 30, lift it up and lock it by pressing the tonearm lift forward.

Balancing the Tonearm*

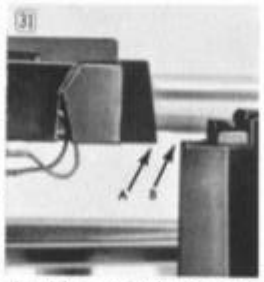
1. With the tonearm locked and the stylus force scale set at 0, slip the shaft of the tonearm counterbalance onto the rear of the tonearm, guiding it on by the V-shaped track.

2. Unlock the tonearm, lift it off the rest post, and slide the counterbalance back and forth until the arm is roughly balanced. Then tighten the set screw 14.

3. Now rotate the counterbalance until the tonearm is perfectly balanced. To raise the tonearm head,

**Instructions for installing on base, mounting cartridge and balancing tonearm apply for Dual 1019's purchased as separate components. If your Dual is already mounted within a console, these installation procedures have already been made for you. However, reading these three sections will help familiarize you with the unit.*

rotate the counterbalance clockwise . . . and vice versa. The tonearm will be perfectly balanced when points A on the tonearm head and B on the resting post line up as shown in Fig. 31.



As a further confirmation of perfect tonearm balance, let the tonearm float freely then tap the chassis from the top. The tonearm should remain horizontal, even while the chassis vibrates. Perfect tonearm balance is, of course, especially important with extremely lightweight tracking.

NOTE: the counterbalance has been pre-set at a mid-position on its threads. If at any time in the future, you find it too close to either end of the shaft, simply rotate it in the opposite direction for a few turns. Then resume with instruction 1.

Applying Stylus Force

Once the tonearm is balanced at zero, you simply dial the stylus force. The number on the direct-reading dial 12 is accurate to within 0.1 gram. The instructions accompanying your cartridge will give you the range of minimum and maximum tracking forces its manufacturer suggests.

As the tonearm of the Dual 1019 can track flawlessly as low as ½ gram, the only limitations on tracking are those imposed by the cartridge itself. That is why you can use any cartridge you prefer with the Dual 1019, including those with ultra-high compliance styli not ordinarily recommended for use in automatic tonearms.

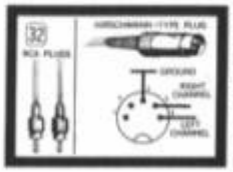
Applying Anti-Skating Compensation

The Dual 1019 is equipped with continuously variable anti-skating compensation. (See page 4, for full explanation.)

To apply anti-skating compensation for the tracking force you have set for your cartridge, simply rotate the anti-skating dial 16 to the same number as on the stylus force dial.

Connection to Amplifier
(or other audio equipment)

1. The red phono cable is for the left channel, the yellow cable for the right channel. Connect to your amplifier or other audio equipment according to their instructions.



2. The phono cables for your Dual may be supplied with either RCA plugs or Hirschmann-type plugs. Both types are shown in Fig. 32, plus the channel connection schematic for the Hirschmann-type.

To Prepare for First Play

Because of the extremely free action of the trip lever, it is apt to be shifted out of position when the Dual is in transit. So before connecting the Dual to a power supply, do the following:

1. Lock the tonearm on its post.
2. Push the operating slide switch to START.
3. Rotate the platter by hand until the switch returns to "neutral."

Connection to Power Supply

AC voltage and line frequency (cycle) requirements are indicated on both the outside of the carton and on top of the chassis beneath the turntable platter. Check before connecting to power supply.

Note to servicemen: The Dual can be set for either 110 VAC or 220 VAC. It can also be used with line frequency of either 50 or 60 cycles. The 60 cycle pulley is Part Number 31-N-U28; the 50 cycle pulley is Part Number 31-N-U20.

Power Control for Amplifier Shut-Off

Your Dual 1019 is equipped with a unique provision for controlling the power to the amplifier, so that the entire system can be switched on and off automatically by the turntable. To take advantage of this special feature (which handles up to 3 amps), consult your Dual dealer or a qualified serviceman.

Special Adjustments for Positioning Tonearm

The Dual's tonearm has been carefully set at the factory to descend accurately into the lead-in groove during automatic start and for proper height in cycling. But if you should ever want to vary these positions, you can do so quite easily as follows:

Adjustment for Lead-In Groove

1. Move record-size selector switch to 7" position. This will expose the adjustment screw 8 through the opening in the chassis near the tonearm post.
2. If the stylus had touched down outside the lead-in grooves, turn the screw clockwise (very slightly). If the stylus had touched down on the recorded grooves, turn the screw counter-clockwise.

(Although it is most convenient to use a 7" record, any size record can be used to make and check the adjustment, as once the tonearm has been correctly set for one size record, it will be correct for all. Just be sure to set the size selector switch back for the record size you're using if you don't have a 7" record.)

Adjustment for Cycling Height

This would be necessary only if the top of the tonearm head touches the bottom record of the stack on the changer spindle. In that case, the height of the tonearm can be lowered by turning the height adjustment screw 13 clockwise.

Servicing

If your Dual 1019 ever requires servicing, either take it to your Dual audio dealer, or ask him for the address of the nearest Authorized Dual Service Station. Be sure that authentic Dual parts are used whenever replacement is necessary. *Always ship the Dual in its original packaging, or if it has been discarded, write for special shipping instructions.*

Aufsetzen des Plattentellers
Montagefolge nach Fig. 2–4

Mounting of Platter
Proceed in sequence Nos. 2–4

Mise en place du plateau
Suite des opérations suivant figures 2 à 4

Montaje del plato
Según figuras 2 a 4

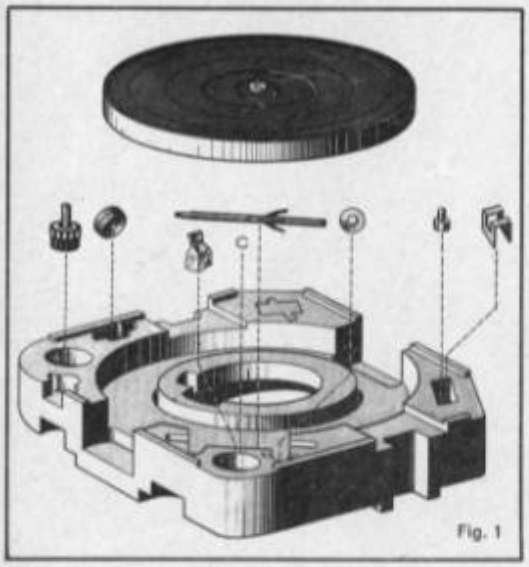


Fig. 1

Plattenteller mit Zubehör für Dual 1019
Platter with accessories for Dual 1019
Plateau avec accessoires pour Dual 1019
Plato con accesorios para Dual 1019

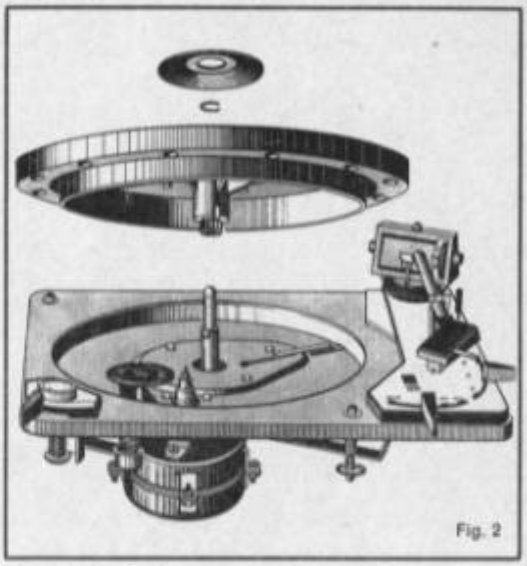


Fig. 2

Plattenteller behutsam aufsetzen
Lower platter carefully on spindle
Mettre doucement le plateau en place
Colocar el plato con sumo cuidado

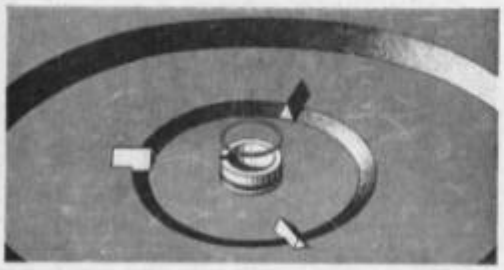


Fig. 3

Einsetzen des Sprengrings
Insert spring clip
Mise en place du clip
Colocar el muelle

Fig. 4

Einsetzen der Abdeckscheibe
Insert decorative disc
Mise en place de la rondelle-enjoliveur
Colocar la arandela de fijación

Dual

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St. Georgen/Schwarzwald

Printed in Germany

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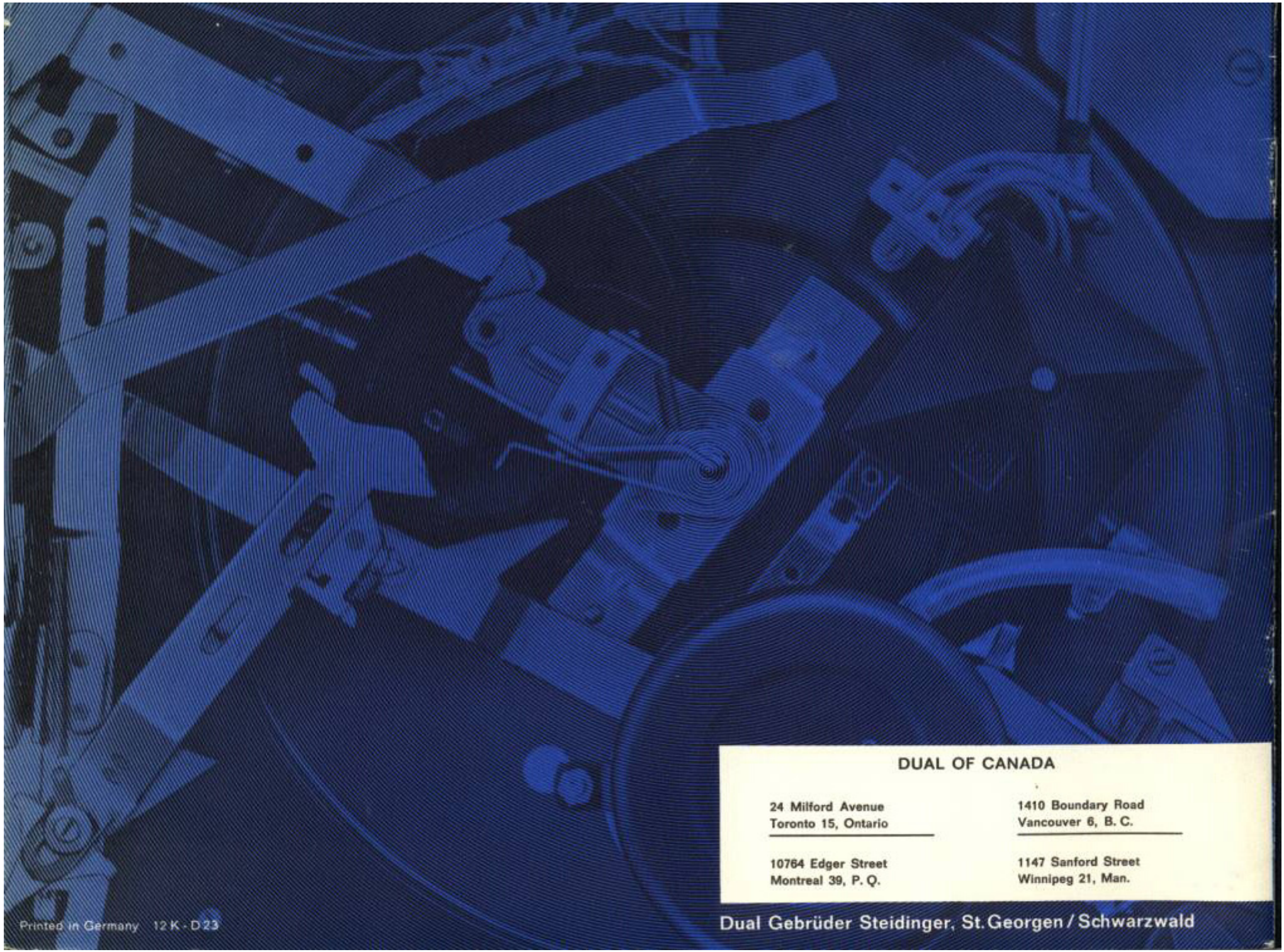

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